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FACSIMILE TRANSMISSION

Date: 7/8/2005

Pages: 1 of 20

To: Examiner Melvin, C. MAYES
Art Unit 1734

From: Robert Scott

Company: USPTO

Fax No.: 571-273-1234 and 703 872 9306

Subject: U.S. Patent Application Serial No. 10/643,919

Comments: /

Applicants: YAZAKI et al. Serial No.: 10/643,919 Filed: 10/20/2003 Title: METHOD OF MANUFACTURING A PRINTED WIRING BOARD	Atty. Dkt.: 01-244-DIV Art Unit: 1734 Examiner: MAYES
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Typed Name: Robert L. Scott, II.

Signature: 

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: YAZAKI et al.

Serial No.: 10/643,919

Filed: 10/20/2003

Title: METHOD OF MANUFACTURING A
PRINTED WIRING BOARD

Atty. Dkt.: 01-244-DIV

Art Unit: 1734

Examiner: MAYES

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Date: 8 July 2005

CERTIFICATE OF FACSIMILE TRANSMISSION

I hereby certify that this correspondence is being facsimile transmitted to the USPTO (Fax No. 703-872-9306) on this date: 8 July 2005
Typed Name: Robert B. Scott, II.Signature: COMMUNICATION

Sir:

In response to the telephonic inquiry from the Examiner, of July 8, 2005 regarding the Information Disclosure Statement (IDS) submitted on January 4, 2005, please find attached the following.

1) a copy of the IDS of January 4, 2005 including a stamped postcard from OIPE and a copy of a communication from a foreign patent office. It should be noted that U.S. counterparts to the references indicated in the communication, e.g. CN 1177901 and CN 1236798 were submitted in an IDS filed on May 18, 2004.

2) a copy of the IDS of May 18, 2004 noted above including a stamped postcard from OIPE. Applicants note that in discussing the matter with the Examiner it appears this IDS was misplaced and was therefore not made of record. In addition, a non-related paper was made of record in the file.

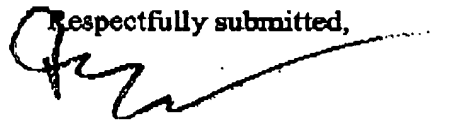
Serial No. 10/643,919

The Examiner is requested to consider the communication from the foreign office noted in item 1) above, and is further requested to review and consider the references from the IDS of May 18, 2004 including the references from the foreign communication and return an initialed form PTO-1449 associated therewith.

In view of the Examiner's amendment also discussed by telephone on July 8, 2005 to correct two typographical errors, the applicants respectfully submit that the present application is in condition for allowance. A timely notice to that effect accompanied by the initialed form PTO-1449 is respectfully requested. If questions relating to patentability remain, the examiner is invited to contact the undersigned by telephone.

Please charge any unforeseen fees that may be due to Deposit Account No. 50-1147.

Respectfully submitted,



Robert L. Scott, II
Reg. No. 43,102

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(6)

Applicant: YAZAKI et al.

Title: : METHOD OF MANUFACTURING A PRINTED WIRING
BOARD

Serial No.: 10/643,919

Filing Date: August 20, 2003

Atty Dkt.: 01-244-DIV

Please acknowledge receipt of the following by date stamping this postcard
and returning to Pozz & Bethards, PLC:

- Information Disclosure Statement
- Copy of communication from a foreign patent office in a foreign
counterpart application



Submission Date: January 4, 2005

Appl No: 011338407

Your Ref: 62311-CN-JEB/st

Our Ref: CPCH0163681

Text of the Second Office Action

In accordance with the First Office Action, the applicant makes amendments to the claims and the description. On July 13, 2004, the applicant filed the Observations and the replacement sheets of the amended documents. After examination, comments are made on the above documents:

1. Reference document 1 (CN 1177901 A) discloses a printed wiring board formed by interconnected layers (see Line 14 on Page 5 to Line 30 on Page 6 of the description of reference document 1, and Figures 1-4). Said printed board comprises an insulate adhesive sheet (see reference sign 114). The wiring patterned conductor is up and down the copper insulate sheet. At least one via hole being formed in the insulate sheet. And either conductive paste or metal can be filled in the via hole. The conductor forming the wiring pattern can be copper (see Line 30 on Page 6 of the description), and the metal filled in the via hole is tin (see Line 8 on Page 6 of the description). In the manufacturing arts of heating and pressing, tin and copper inevitably diffuse and form a certain amount of tin-copper alloy (equivalent to a second type of conductive material). Therefore, the difference between the printed wiring board claimed by Claim 1 and that disclosed by reference document 1 lies in that: the first type of conductive material includes a first metal and a second metal, and the second metal has a melting point higher than the first metal. Reference document 2 (CN 1236798 A) also discloses a printed wiring board having a similar structure to that of reference document 1. However, the via hole thereof is filled with conductive paste (see Line 3 on Page 4 to Line 32 on Page 8 of the description of reference document 2, and Figures 1-5). The conductive paste includes conductive particles which can be alloy particles of arbitrarily-combined materials selected from the group consisting of gold, platinum, silver, palladium, copper, nickel, tin, lead, indium and chromium. Because the melting points of these elements are different, two metals selected from them inevitably have a higher melting point and a lower melting point, and thus are equivalent to a first

metal and a second metal. Reference document 1 has disclosed that the via hole can be filled with tin. On this basis, it is obvious to persons skilled in the art to select another metal from the elements listed by reference document 2 and fill it into the via hole in order to improve the connecting strength and electrical connectivity. Because tin has a lowest melting point among the optional metals disclosed by reference document 2, tin is equivalent to the first metal. And another metal with a melting point higher than tin is equivalent to the second metal. Therefore, Claim 1 does not have prominent substantive features or notable progress, and does not comply with the provision on inventiveness under Article 22-Paragraph 3 of the Chinese Patent Law.

2. The additional technical features of the new amended Claims 2-10 are substantively the same as those of the original Claims 2-10 (only the reference relationships and several terms are amended, and some repeated technical features are deleted). Because the First Office Action has commented on the original Claims 2-10 in detail, for conciseness, the new Claims 2-10 will not be specifically commented. The conclusion is that the additional technical features of Claims 2-10 are respectively disclosed by reference document 2 or 3. Under the condition that Claim 1 does not have inventiveness, dependent Claims 2-10 do not comply with the provision of Article 22-Paragraph 3 of the Chinese Patent Law. Reference document 3 discloses two metals, i.e., tin and gold. Obviously, the melting point of tin is much lower than that of gold. Therefore, on the basis of reference documents 1 and 2, it is clear to persons skilled in the art that tin having a lower melting point is equivalent to the first metal in the present application and gold having a higher melting point is equivalent to the second metal in the present application.

3. "the interlayer conducting material" in the original Claim 11 is replaced with "the conductive layer" in independent Claim 11. According to the comments on Claim 11 in the First Office Action, Au-Sn in reference document 3 can be regarded as a conductive layer. Thus Claim 11 does not have inventiveness as prescribed by Article 22-Paragraph 3 of the Chinese Patent Law. Likewise, according to the First Office Action, dependent Claims 12-26 do not comply with the provision on inventiveness under Article 22-Paragraph 3 of the Chinese Patent Law. It is conventional technique in the art to add dispersing agent into the

solution. The weight of the dispersing agent is only connected with the weight of solid to be dispersed. Therefore, although reference document 4 fails to disclose that the paste contains a first metal and a second metal, it has provided enough technical motivation. Thus, on the basis of reference documents 1 and 3, it is obvious to persons skilled in the art to apply the content of dispersing agent in reference document 4 to the conductive paste.

4. Claim 2 adopts the expression "the first metal is at least one of tin and indium". The phrase "at least" implies that there may be two metals. However, the subject is "the first metal". Thus the scope of protection sought by Claim 2 is unclear. For the same reason, the scopes of protection sought by Claims 3, 12 and 13 are unclear. Claim 5 adopts the expression "the metal". However, Claim 1 has three metals, i.e., "a first metal", "a second metal" and "the conductor metal". Therefore, it is not clear which one of the three metals is "the metal" in Claim 5. Thus the scope of protection sought by Claim 5 is unclear (in the comments on inventiveness, according to the understanding on the description, "the first metal" is taken as "the metal" in Claim 5). For the same reason, it is not clear "the metal materials" in Claim 21 refers to which one(s) of "a first metal", "a second metal" and "the conductor metal". Therefore, Claims 2, 3, 5, 12, 13 and 21 do not comply with the provision of Rule 20-Paragraph 1 of the Implementing Regulations of the Chinese Patent Law.

5. Claim 11 mentions "an interlayer conducting material" and "a solid conductive material" in the via hole. However, the relationship between the two is not indicated. It is not clear whether they are two materials or only one material. Thus the scope of protection is unclear. For the same reason, the scope of protection sought by Claim 27 is unclear. Claim 17 mentions "particles made of the first metal material and particles made of the second metal material are included in the interlayer conductive material". However, Claim 11 to which Claim 17 refers mentions "the conductive layer includes a first metal material and a second metal material". It is not clear whether "the conductive layer" is the equivalent to "the interlayer conductive material". Therefore, Claims 11, 17 and 27 do not comply with the provision of Rule 20-Paragraph 1 of the Implementing Regulations of the Chinese Patent Law.

6. Claim 11 fails to indicate that the solid phase diffusion layer is *an alloy* formed by a first metal material and a conductor metal. According to the disclosure of the description, it should be an alloy. In order to form an alloy, the first metal material should be in a melted state. However, the present Claim 11 fails to indicate the relationship between the melting point of the first metal material and the predetermined temperature. Therefore, it is not clear whether the first metal material is in a melted state under the predetermined temperature. Thus one cannot make sure whether the solid phase diffusion layer is formed. It can be seen that Claim 11 lacks essential technical features for carrying out its technical solutions, and does not comply with the provision of Rule 21-Paragraph 2 of the Implementing Regulations of the Chinese Patent Law.

7. Independent Claims 1, 11 and 27 do not share a common or corresponding specific technical feature. Thus said claims do not comply with the provision on unity under Article 31-Paragraph 1 of the Chinese Patent Law.

The applicant should submit the new claims within the time limit as specified by this office action, and should state the reasons why the amended application documents are patentable. The amendments shall be in conformity with Article 33 of the Chinese Patent Law and shall not go beyond the scope of the disclosure contained in the initial description and claims. If the documents submitted by the applicant still fail to rectify the above defects or if no forceful arguments are provided, pursuant to Article 38 of the Chinese Patent Law, the examiner will reject the present application in accordance with Rule 53 of the Implementing Regulations of the Chinese Patent Law.

xhl

CPCH0163681

Patent Office of the People's Republic of China

Address: Receiving Section of the Chinese Patent Office, No. 6 Tucheng Road West, Haidian District, Beijing, Postal code: 100088

Applicant	DENSO CORPORATION		Date of Issue October 15, 2004
Agent	China Patent Agent (H.K.) Ltd.		
Patent Application No.	01133840.7	Application Date December 25, 2001	
Title of Invention	PRINTED WIRING BOARD AND METHOD OF MANUFACTURING A PRINTED WIRING BOARD		

Second Office Action

拒絕理由書

- ☒ The examiner has received the Observations, submitted by the applicant on July 13, 2004 in response to the First Office Action issued by the Patent Office, and on this basis continued to conduct examination as to substance of the captioned patent application.

☐ On the basis of the Reexamination Decision made by the Reexamination Board of the Chinese Patent Office on _____, the examiner has continued to conduct examination as to substance of the captioned patent application.

☐
- Further examination has been conducted in the light of the following application document(s):

☐ the amended application document(s) attached to the said observations.

☒ the application document(s) at which the previous Office Action is directed, and the replacement sheet(s) of the amended application document(s) attached to the said Observations.

☐ the application document(s) at which the previous Office Action is directed.

☐ the application document(s) confirmed in the said Reexamination Decision.

☐
- ☒ In this Office Action no new reference documents have been cited.

☐ The following reference document(s) is/are cited in this Office Action. (Its/Their serial number(s) shall come after those previously cited and will continue to be used throughout the examination procedure):

Serial No.	Number of File(s) of Reference Document(s)	Date of Publication (or filing date of interfering app.)

4. Concluding comments of the examiner:

☐ On the description:

- ☐ The amendment to the description is not in conformity with the provision of Art. 33 of the Patent Law.
- ☐ The content of the application comes within the scope where no patent right shall be granted as prescribed in Art. 5 of the Patent Law.
- ☐ The description is not in conformity with the provision of Art. 26, para. 3 of the Patent Law.
- ☐ The drafting of the description is not in conformity with the provision of Rule 18 of the Implementing Regulations.

☒ On the claims:

- ☐ The amendment to Claim(s) _____ is not in conformity with the provision of Art. 33 of the Patent Law.
- ☐ Claim(s) _____ come(s) within the scope where no patent right shall be granted as prescribed in Art. 25 of the Patent Law.
- ☐ Claim(s) _____ is/are not in conformity with the definition of invention in Rule 2, para. 1 of the Implementing Regulations.
- ☐ Claim(s) _____ possess(es) no novelty as prescribed in Art. 22, para. 2 of the Patent Law.
- ☒ Claim(s) 1-26 possess(es) no inventiveness as prescribed in Art. 22, para. 3 of the Patent Law.
- ☐ Claim(s) _____ possess(es) no practical applicability as prescribed in Art. 22, para. 4 of the Patent Law.
- ☐ Claim(s) _____ is/are not in conformity with the provision of Art. 26, para. 4 of the Patent Law.
- ☒ Claim(s) 1, 11 and 27 is/are not in conformity with the provision of Art. 31, para. 1 of the Patent Law.
- ☒ Claim(s) 2, 3, 5, 11-13, 17, 21 and 27 is/are not in conformity with the provision of Rule 20 of the Implementing Regulations.

- ☒ Claim(s) 11 is/are not in conformity with the provision of Rule 21 of the Implementing Regulations.
- ☐ Claim(s) is/are not in conformity with the provision of Rule 12, para.1 of the Implementing Regulations.

See the text portion of this Office Action for a detailed analysis of the above concluding comments.

5. In view of the above concluding comments, the examiner deems that
- ☐ the applicant should make amendment to the application document(s) according to the requirements raised in the text portion of this Office Action.
 - ☒ the applicant should expound in his/its observations the reason why the captioned patent application is patentable and make amendment to what is not in conformity with the provisions as pointed out in the text portion of this Office Action, otherwise the said application will be rejected.
 - ☐ the patent application has no substantive content(s) for which the patent right may be obtained, if the applicant has no sufficient reason to demonstrate that the captioned application may be granted a patent right, said the application will be rejected.

6. The applicant should pay attention to the following matters:

- (1) According to the provision of Art. 37 of the Patent Law, the applicant should submit his/its observations within two months from the date of receipt of this Office Action; if, without any justified reason(s), the time limit for making a response is not met, the said application shall be deemed to have been withdrawn.
- (2) The amendment(s) made by the applicant to the application should be in conformity with the provisions of Art. 33 of the Patent Law and Rule 51 of the Implementing Regulations thereof, the amended text should be in duplicate and its form should conform to the relevant provisions of the Guidelines for Examination.
- (3) The observations and/or amended text of the applicant should be submitted to the Receiving Section of the Chinese Patent Office by mail or by personal delivery. If not submitted Receiving Section by mail or by personal delivery, the document(s) will have no legal effect.
- (4) If no appointment is made in advance, the applicant and/or the agent shall not come to the Chinese Patent Office to hold an interview with the examiner.

7. This Office Action consists of the text portion totaling 4 page(s) and of the following attachment(s):

- ☐ copy(copies) of the reference document(s) cited totaling page(s).